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ORIGINAL PAPER

Decreasing the minimum length criterion for an episode of hypomania: evaluation using self-reported data from patients with bipolar disorder

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Abstract Brief hypomania lasting less than 4 days may impair functioning and help to detect bipolarity. This study analyzed brief hypomania that occurred in patients with bipolar disorder who were diagnosed according to the DSM-IV criteria. Daily self-reported mood ratings were obtained from 393 patients (247 bipolar I and 146 bipolar II) for 6 months (75,284 days of data, mean 191.6 days). Episodes of hypomania were calculated using a 4, 3, 2, and single day length criterion. Brief hypomania occurred frequently. With a decrease in the minimum criterion from 4 days to 2 days, there were almost twice as many patients with an episode of hypomania (102 vs. 190), and more than twice as many episodes (305 vs. 863). Single days of hypomania were experienced by 271 (69%) of the sample.

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With a 2-day episode length, 33% of all hypomania remained outside of an episode. There was no significant difference in the percent of hypomanic days outside of an episode between patients with bipolar I and II disorders. There were no significant differences in the demographic characteristics of patients who met the 4-day minimum as compared with those who only experienced episodes of hypomania using a shortened length criterion. Decreasing the minimum length criterion for an episode of hypomania will cause a large increase in the number of patients who experience an episode and in the aggregate number of episodes, but will not distinguish subgroups within a sample who meet the DSM-IV criteria for bipolar disorder. Frequency may be an important dimensional aspect of brief hypomania. Clinicians should regularly probe for brief hypomania.

Keywords Bipolar disorder, hypomania · Brief hypomania · DSM-IV criteria

Introduction

Many patients with bipolar disorder experience hypomania for periods less than the minimum episode length criterion of 4 days in the DSM-IV [1–4]. There is a need to increase focus on this brief hypomania since even subsyndromal symptoms may impair functioning and diminish the quality of life [5–7]. Additionally, some researchers feel that a shorter length criterion would better reflect the entire spectrum of bipolar disorder, and improve detection of bipolarity in patients with depressive episodes [2, 3, 8–10]. The criteria used to define an episode of hypomania are under revision as part of the ongoing DSM-V review process [11]. Within this context, the primary objective of this study was to characterize brief hypomania lasting less than 4 days that is experienced by patients who meet the DSM-IV criteria for bipolar disorder. The secondary objective was to determine if the patients who experienced an episode of hypomania only when using a shortened criterion were a distinct subgroup from those who met the 4-day criterion during the study period.

We have previously investigated the impact of changing the length criterion for an episode of hypomania from 4 days to 2 using daily self-reported mood ratings from 203 patients who were diagnosed with bipolar disorder using the DSM-IV criteria [4]. As the minimum length criterion for an episode of hypomania decreased, a large increase was found in both the number of patients with episodes and the number of episodes. This study repeated the prior analysis using a larger sample and including a length criterion of a single day.

Methods

The inclusion criteria were a diagnosis of bipolar disorder by DSM-IV criteria, age 18 years or older, currently receiving pharmacological treatment and a willingness to record mood daily for 5 months using computer software in their native language. All participants volunteered, provided informed written consent, and received treatment as usual throughout the study. The naturalistic approach with minimal exclusion criteria was selected to better reflect routine clinical practice and patient heterogeneity. The diagnosis of bipolar disorder was made by the prescribing psychiatrist in a clinical interview. Additional details about the ChronoRecord study were published previously [12]. Patients from our prior study [4] were included in this analysis, although some provided additional data.

Daily mood ratings

Patients provided a daily mood rating using the previously validated ChronoRecord software that was installed on a home computer [13, 14]. A 100-unit visual analogue scale was used to rate mood between the most extreme mania and depression the patient ever experienced. Based upon the validation studies comparing the self-ratings with clinician ratings on the Hamilton Depression Rating Scale (HAMD) and the Young Mania Rating Scale (YMRS) [13, 14], a mood entry less than 40 was considered depression, 40–60 euthymia, and greater than 60 hypomania/mania. A rating of 61–80 was considered hypomania and 81–100 was considered mania. The self-ratings of mania reflect activation levels for either euphoric or dysphoric mood [13]. A detailed account of data collection using ChronoRecord is provided elsewhere [12–14].

Statistics

The demographic characteristics, mood ratings, and psychotropic medications taken by the patients were obtained. To be considered using a medication, a patient had to take any dose of the drug for at least 50% of the days. Episodes of hypomania and depression were determined using a published algorithm to calculate episodes from daily self-reported mood data based on the DSM-IV criteria [15]. Episodes of hypomania were also calculated while varying the minimum duration between 3, 2, and 1 days. The demographic characteristics and medications taken were compared between patients with bipolar I and bipolar II disorder, using the Pearson 2-sided X^2 test for distributions and the independent sample 2-sided t test for mean values. For the subgroup analysis, the demographic characteristics

and medications taken were compared between patients with one or more episode of hypomania using the 4-day length criterion, and those with one or more episode of hypomania only if a shorter criterion was used (4-day vs. 3-day length, 4-day vs. 2-day length, and 4 day vs. 1-day length). A P value of less than 0.05 was considered statistically significant for all tests. SPSS 18.0 was used for all calculations.

Results

Data were available from 410 patients, 247 with a diagnosis of bipolar I disorder, 146 with a diagnosis of bipolar II disorder, and 17 with a diagnosis of bipolar NOS. Since the group with a diagnosis of bipolar NOS was so small, they were excluded from this analysis leaving 393 patients.

The 393 patients returned 75,284 days of data (mean 191.6 days). Of the 393 patients 266 (68%) were recruited from a university mood clinic, and 127 (32%) from a private practice. The demographic characteristics of those with BP I and BP II disorder are shown in Table 1. Patients with bipolar I disorder had more hospitalizations (2.8 vs. 1.4, $P = 0.002$), took antidepressants less frequently (45 vs. 63%, $P < 0.001$), lamotrigine less frequently (33 vs. 45%, $P = 0.018$), and lithium more frequently (32 vs. 21%, $P = 0.018$). No other significant differences in demographic characteristics were found between patients with bipolar I and bipolar II disorder.

The impact of changing the minimum length requirement for an episode of hypomania is shown in detail in Table 2. When the minimum episode length was decreased from 4 to 2 days, the percent of days spent in a hypomanic episode by each patient nearly doubled (4.5–8.2%), and the number of

Table 1 Comparison of demographics of patients with diagnosis of bipolar I or bipolar II disorder

	Diagnosis				
	Bipolar I ($N = 247$)	Bipolar II ($N = 146$)	Total ($N = 393$)	Degrees of freedom (DF)	P
Age (mean years, SD)	39.4 (11.2)	38.2 (11.4)	39.0 (11.3)	299.1[a]	0.299
Age of onset (mean years, SD)	22.6 (9.7)	20.9 (10.9)	22.0 (10.2)	240.4[a]	0.133
Years of illness (mean years, SD)	16.9 (11.1)	17.7 (12.3)	17.2 (11.5)	241.7[a]	0.535
Hospitalizations (mean N, SD)	2.8 (4.2)	1.4 (3.2)	2.3 (3.9)	326.1[a]	0.001
Gender				1[b]	0.059
Female (N, %)	160 (65)	108 (74)	268 (68)		
Male (N, %)	87 (35)	38 (26)	125 (32)		
Education level				2[b]	0.274
High school (N, %)	33 (14)	12 (9)	45 (12)		
Some college (N, %)	75 (33)	45 (33)	120 (33)		
College graduate (N, %)	121 (53)	79 (58)	200 (55)		
Employment status				2[b]	0.079
Disabled (N, %)	66 (29)	25 (19)	91 (25)		
Working full-time (N, %)	102 (44)	72 (56)	174 (49)		
Other (N, %)	61 (27)	33 (25)	94 (26)		
Marital status				2[b]	0.370
Married (N, %)	107 (46)	66 (50)	173 (47)		
Single (N, %)	90 (39)	52 (39)	142 (39)		
Divorced (N, %)	37 (15)	14 (11)	51 (14)		
Number of daily medications (mean N, SD)	2.8 (1.6)	2.6 (1.5)	2.7 (1.6)	322.8[a]	0.330
Taking mood stabilizer (N, %)	204 (83)	111 (76)	315 (80)	1[b]	0.115
Taking lithium (N, %)	78 (32)	30 (21)	108 (28)	1[b]	0.018
Taking valproate (N, %)	49 (20)	32 (22)	81 (21)	1[b]	0.622
Taking lamotrigine (N, %)	82 (33)	66 (45)	148 (38)	1[b]	0.018
Taking antidepressant (N, %)	110 (45)	92 (63)	202 (51)	1[b]	<0.001
Taking antipsychotic (N, %)	114 (46)	57 (39)	171 (44)	1[b]	0.169
Taking benzodiazepine (N, %)	51 (21)	35 (24)	86 (22)	1[b]	0.441
Taking sleep medication (N, %)	18 (7)	7 (5)	25 (6)	1[b]	0.328

[a] Student's t test, equal variances not assumed

[b] Pearson Chi-Square test

Table 2 Impact of changing the minimum episode length for hypomania for patients with bipolar disorder

	Hypomanic episode minimum length								% Change	
	4 days		3 days		2 days		1 day			
	N	%	*N*	%	*N*	%	*N*	%	4–2 day	4–1 day
All patients ($N = 393$)										
Mean percent days in hypomanic episode		4.5		5.9		8.2		10.6	82	136
Mean percent days in depressed episode		8.2		8.0		8.0		7.3	−2	−11
Number of hypomanic episodes	305		491		863		2,164		183	610
Number of depressed episodes	303		293		289		264		−5	−13
Number of patients with hypomanic episodes	102	26	145	37	190	48	271	69	86	166
Number of patients with depressed episodes	113	29	114	29	114	29	108	28	1	−4
All hypomanic days ($N = 6,188$)										
Hypomanic days in hypomanic episode	2,699	44	3,356	54	4,169	67	6,188	100	54	129
Hypomanic days not in hypomanic episode	3,489	56	2,832	46	2,019	33	0	0	−42	−100
All depressed days ($N = 15,699$)										
Depressed days in depressed episode	5,988	38	5,901	38	5,839	37	5,578	36	−2	−7
Depressed days not in depressed episode	9,711	62	9,798	62	9,860	63	10,121	64	2	4
All hypomanic days bipolar I ($N = 3,772$)										
Hypomanic days in hypomanic episode	1,650	44	2,046	54	2,531	67	3,772	100	53	126
Hypomanic days not in hypomanic episode	2,122	56	1,726	46	1,241	33	0	0	−42	−100
All hypomanic days bipolar II ($N = 2,416$)										
Hypomanic days in hypomanic episode	1,049	43	1,310	54	1,638	68	2,416	100	56	130
Hypomanic days not in hypomanic episode	1,367	57	1,106	46	778	32	0	0	−43	−100

patients experiencing a hypomanic episode nearly doubled (102–190). When the minimum episode length was decreased to 1 day, the percent of days spent in a hypomanic episode by each patient more than doubled (4.5–10.6%), and the number of patients experiencing a hypomanic episode was more than 21/2 times greater (102–271).

With a 4-day length requirement, 56% of reported days of hypomania and 62% of days of depression occurred outside of an episode. When the length requirement was decreased to 2 days, 33% of hypomanic days occurred outside of an episode. With a 1-day length requirement, there was a 13% decrease in depressed episodes for all patients, as the occurrence of brief hypomanic interrupted depressed episodes based on the algorithm.

As the episode length criterion decreased, the pattern of change was very similar for patients with bipolar I and bipolar II disorder. There was no significant difference in the percent of days of hypomania reported outside of an episode between patients with bipolar I and bipolar II disorder whether the minimum length was 4 days ($P = 0.173$), 3 days ($P = 0.212$), or 2 days ($P = 0.404$). When the minimum length was 1 day, all hypomania was included in an episode.

With a 4-day length criterion, 102 patients experienced at least one episode of hypomania. With a 3-day length criterion, there were 43 additional patients with at least one episode of hypomania. With a 2-day length criterion, there were 88 additional patients, and with a 1-day length, 169 additional patients. The comparison of the demographic characteristics of the 102 patients who experienced at least one episode of hypomania with a 4-day length, with the additional patients who experienced a hypomanic episode as the length criterion was shortened is shown in Table 3. There was no demographic that was significantly different across all the additional patient groups. As the length criterion decreased, a significantly smaller percentage of patients who had a hypomanic episode were taking antipsychotics (4-day vs. 2-day, 53 vs. 38%, $P = 0.033$; and 4-day vs. 1-day, 53 vs. 39%, $P = 0.026$).

Discussion

Hypomania lasting less than 4 days occurred frequently in this study of patients diagnosed with bipolar disorder using the DSM-IV criteria. As the minimum length criterion for an episode of hypomania decreased, there was a large increase in both the number of patients experiencing an episode and in the number of episodes. When comparing a 2-day minimum length to a 4-day minimum length, there were almost twice as many patients with an episode of hypomania, and about twice as many episodes. These

Table 3 Demographics of patients with 4 day hypomanic episodes compared to additional patients with 3, 2, and 1 day hypomanic episodes

	4 day hypomanic episode Patients ($N = 102$)	3 day hypomanic episode			2 day hypomanic episode			1 day hypomanic episode		
		Additional patients ($N = 43$)	DF	*P*	Additional patients ($N = 88$)	DF	*P*	Additional patients ($N = 169$)	DF	*P*
Age[a] (mean years, SD)	38.9 (11.9)	40.4 (9.0)	103.1	0.400	39.5 (11.0)	187.1	0.687	39.8 (11.3)	204.9	0.524
Age of onset[a] (mean years, SD)	23.8 (11.3)	20.1 (10.3)	79.9	0.068	20.6 (10.9)	169.2	0.054	21.4 (10.7)	188.7	0.102
Years of illness[a] (mean years, SD)	15.5 (10.7)	20.0 (10.8)	73.1	0.032	19.0 (12.2)	158.4	0.050	18.4 (12.6)	221.1	0.054
Hospitalizations[a] (mean *N*, SD)	2.8 (5.0)	2.5 (3.1)	120.4	0.548	1.8 (2.5)	137.2	0.079	1.9 (2.8)	125.1	0.075
Diagnosis[b]			2	0.279		1	0.650		1	0.925
Bipolar I (*N*, %)	64 (63)	31 (72)			58 (66)			107 (63)		
Bipolar II (*N*, %)	38 (37)	12 (28)			30 (34)			62 (37)		
Gender[b]			1	0.423		1	0.705		1	0.570
Female (*N*, %)	71 (70)	27 (63)			59 (67)			112 (66)		
Male (*N*, %)	31 (30)	16 (37)			29 (33)			57 (34)		
Education level[b]			2	0.544		2	0.736		2	0.423
High school (*N*, %)	13 (14)	3 (8)			9 (11)			18 (11)		
Some college (*N*, %)	35 (38)	15 (37)			29 (35)			51 (32)		
College graduate (*N*, %)	45 (48)	22 (55)			44 (54)			91 (57)		
Employment status[b]			2	0.169		2	0.030		2	0.103
Disabled (*N*, %)	21 (24)	11 (28)			20 (25)			37 (23)		
Working full-time (*N*, %)	51 (59)	17 (42)			33 (41)			75 (48)		
Other (*N*, %)	15 (17)	12 (30)			27 (34)			46 (29)		
Marital status[b]			2	0.928		2	0.928		2	0.927
Married (*N*, %)	45 (48)	20 (50)			36 (46)			78 (49)		
Single (*N*, %)	34 (37)	15 (37)			30 (38)			59 (37)		
Divorced (*N*, %)	14 (15)	5 (13)			13 (16)			21 (13)		
Number of daily medications[a] (mean *N*, SD)	2.8 (1.6)	2.7 (1.4)	86.8	0.769	2.6 (1.6)	184.7	0.310	2.6 (1.5)	206.3	0.183
Taking any mood stabilizer[b] (*N*, %)	80 (78)	36 (84)	1	0.467	69 (78)	1	0.997	133 (79)	1	0.959
Taking lithium[b] (*N*, %)	30 (29)	11 (26)	1	0.640	20 (23)	1	0.297	40 (24)	1	0.295
Taking valproate[b] (*N*, %)	24 (24)	11 (26)	1	0.792	20 (23)	1	0.896	34 (20)	1	0.507
Taking lamotrigine[b] (*N*, %)	34 (33)	14 (33)	1	0.928	29 (33)	1	0.956	64 (38)	1	0.451
Taking antidepressant[b] (*N*, %)	50 (49)	23 (54)	1	0.623	44 (50)	1	0.893	86 (51)	1	0.766
Taking antipsychotic[b] (*N*, %)	54 (53)	17 (40)	1	0.140	33 (38)	1	0.033	66 (39)	1	0.026
Taking benzodiazepine[b] (*N*, %)	27 (27)	11 (26)	1	0.911	20 (23)	1	0.551	35 (21)	1	0.274
Taking sleep medication[b] (*N*, %)	10 (10)	3 (7)	1	0.586	5 (6)	1	0.293	8 (5)	1	0.104

[a] Student's *t* test, equal variances not assumed

[b] Pearson Chi-Square test

results were very similar to our prior findings, with the current sample about double in size [4].

The majority of symptomatic days occurred outside of a DSM-IV episode, which agrees with prior longitudinal studies of bipolar disorder [16–18]. With a 4-day minimum length, more than half of the days of hypomania occurred outside of an episode. Even with a 2-day minimum length, one-third of all hypomania remained outside of an episode. Single days of hypomania were so frequent that with a length criterion of 1-day, 271 patients (69%) experienced an episode. For any episode length, the percent of hypomanic days occurring outside of an episode did not differ between bipolar I and II disorder. Additionally, about 60% of the reported days of depression occurred outside of an episode regardless of the length criterion for hypomania.

In prior research based on clinician interviews, and including patients with depressive disorders, most hypomania lasted for 1–3 days [1, 2, 8, 9, 19], which is consistent with the current findings. The high frequency of brief hypomania in this sample suggests that if the length criterion for an episode of hypomania is decreased, the frequency criterion should be increased, as frequency may

be an important dimensional aspect of brief hypomania. The current study cannot address whether decreasing the minimum length criterion for an episode of hypomania would improve the accuracy of the diagnosis of bipolar disorder.

While most of the hypomania reported in this study was brief and self-limited, in a sample of patients who are all receiving treatment, the high frequency of hypomanic symptoms occurring outside of a DSM-IV episode is troublesome. Although some patients, especially with bipolar II disorder, report improved functioning when experiencing mild hypomania [20, 21], subsyndromal or residual symptoms of mania are associated with an increased risk of relapse [22, 23]. Furthermore, cumulative morbidity in bipolar disorder, even from mild symptoms, may be associated with more functional impairment than the total number of episodes [12, 24, 25]. Hypomania is associated with a high risk for divorce [3], and over a lifetime, an increased use of health services, an increased need for social welfare, and an increase in suicidal behaviors [6]. Clinicians should probe patients with bipolar disorder for brief hypomanic episodes, and assess whether these are interfering with everyday functioning. One clinical benefit of daily charting may be to improve the detection and monitoring of subsyndromal mood symptoms.

As found in our earlier study [4], there was no significant difference in the occurrence of 1-day hypomania between patients with bipolar I and bipolar II disorders. Additionally, there were no significant demographic differences between patients who met the 4-day length criterion and those who only experienced a hypomanic episode with a shorter length criterion. It does not appear that either experiencing brief hypomanic episodes or single days of hypomania are useful parameters for distinguishing subgroups within a sample of patients who meet the DSM-IV criteria for bipolar disorder.

There are several limitations to this analysis. With a naturalistic design, the patients in this sample varied in disease severity, phase of illness and medications taken. All mood ratings used in this analysis were self-reported, and the ChronoRecord mood rating does not measure the specific components of hypomania/mania or depression. While a ChronoRecord rating of mania/hypomania best reflects activation levels [13], this is not a specific measure of overactivity which may be a core feature of hypomania [2, 8, 26]. Additionally, clinical diagnosis of a hypomanic episode traditionally emphasizes behavioral manifestations and functional impairment. Daily access to a home computer was required throughout the study. However, the demographic profile of the patients who use ChronoRecord is similar to that in other studies of bipolar disorder [12]. This study did not include patients with bipolar disorder who were not receiving treatment, and patients who never experience hypomania that lasts for 4 days. Finally, this study did not address the issues of differentiating brief hypomania from normal mood elevation, or bipolar disorder from unipolar depression.

In conclusion, decreasing the episode length criterion for hypomania will significantly increase the number of patients with episodes and the aggregate number of episodes. Frequency may be an important dimensional aspect of brief hypomania. Decreasing the episode length criterion was not useful for distinguishing subgroups within this sample. Clinicians should probe patients with bipolar disorder for brief hypomanic episodes.

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